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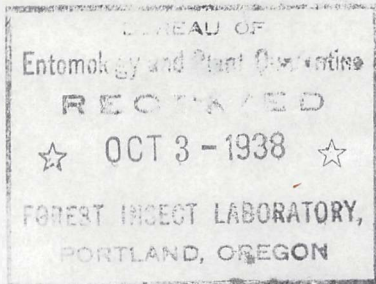
FOREST INSECT INVESTIGATIONS

DOUGLAS FIR BEETLE INFESTATION
CODY CANYON
SHOSHONE NATIONAL FOREST, WYOMING
1938

by
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Recommendations by
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Forest Insect Laboratory
Coeur d'Alene, Idaho
September 23, 1938



File No. _____

Noted by _____

FBK
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Forest Insect Laboratory
Coeur d'Alene, Idaho
Oct. 1, 1938

Refer to file
Project S-10

Dr. F. C. Craighead

Washington, D. C.

Dear Dr. Craighead:

There are enclosed two copies of a report by Mr. Gibson on the Douglas fir beetle infestation within the Cody Canyon of the Shoshone National Forest. To this report I have added my recommendations, which simply designate those areas for which control is advisable. As stated within this report, the situation looks much more favorable than at any time during its progress. The budworm epidemic seems to be decidedly on the wane and the character of the Douglas fir beetle attacks also seems to indicate a material reduction in the beetle population within the area.

You will note that I have designated four areas for which control is questionable, and I have attempted to explain this action within the summary. If labor is available, these four areas could be treated with, I believe, advantage to the entire project.

I am sending a copy of this report direct to the Forest Supervisor and one to the Regional Office. As it is not a new project and as the work will be conducted with CCC labor, no allotment will be required.

Trusting that our recommendations in connection with this problem will be satisfactory, I remain

Respectfully yours,

James C. Evenden
Senior Entomologist

cc to:
Mr. Beal
Mr. Kean ✓

DOUGLAS FIR BEETLE INFESTATION
CODY CANYON
SHOSHONE NATIONAL FOREST, WYOMING
1938

The 1938 survey of the Douglas fir beetle infestation within the Cody Canyon, Shoshone National Forest, was instituted on the 5th of August and completed on the 3rd of September. Mr. A. L. Gibson, Assistant Entomologist, who was in charge of this project, was assisted by Mr. L. W. Hanna, NCF foreman, and two strip runners. This season's survey was confined primarily to those areas which were treated in 1937 and did not include any of the extreme so-called "dark areas".

1938 SITUATION

Although the Douglas fir beetle infestation is distributed throughout most of the areas treated in 1937, there has been a marked reduction in its severity. In accounting for this reduction in the number of infested trees as well as the severity of attacks, there are at least three factors to be considered: (1) excellent job of control during the past season, (2) reduced spruce budworm defoliation during the past two years, and (3) increased tree resistance due to 1938 precipitation. Although it is difficult to establish the relative importance of these contributing factors, it is fully appreciated that as long as a supply of attractive host material is provided through defoliators the bark beetle population will continue to exist. It is gratifying to report a marked decline in the severity of the budworm infestation, and it is believed that as soon as this important factor is eliminated bark beetle control can be discontinued.

AREAS FOR WHICH CONTROL MEASURES ARE RECOMMENDED

(The following data depict the status of the 1938 infestation as revealed by the survey, with a few field notes concerning each area.)

FISHHAWK - MESA CREEK RIVER AREA - 600 acres

Treated 1937 - 0 trees. Estimated 1938 infestation - 121 trees.

Concentration of infestation was noted on two areas and the infested trees showing medium and heavy attacks amounted to 75 percent of the total. Budworm caused light injury over much of the area in 1938 and heavy defoliators where the Douglas fir beetle activity is concentrated.

FISHHAWK - 1,000 acres

Treated 1937 - 260 trees. Estimated 1938 infestation - 146 trees.

Although the infestation is well scattered over this drainage, there are areas where it is concentrated much heavier than in others. It may be possible in spotting this area to eliminate some of the slopes which are sparsely timbered and concentrate on those where bark beetle activity is greatest. Heavy beetle and budworm damage has occurred on this drainage prior to 1938, but there is still ample host material, much of which has been weakened by pre-1938 defoliation. Very little budworm damage in 1938.

KITTY CREEK RIVER AREA^(East) - 200 acres

Treated 1937 - 0 trees. Estimated 1938 infestation - 59 trees.

The infested portion of this area is considerably less than one-half of the amount shown. This area, which can be most easily reached from Kitty Creek, should be treated because of the fairly heavy concentration of infestation. Heavy prior and light 1938 budworm damage has left many trees on this area excellent host material for beetle attack. About 65 percent of the infested trees were only lightly attacked.

LITTLE DEAD HORSE CREEK - 60 acres

Treated 1937 - 33 trees. Estimated 1938 infestation - 30 trees.

Budworm damage light. Most of the attacked trees are fairly large, healthy individuals, with about 70 percent of the attacks considered as medium and heavy.

DEAD HORSE CREEK - 100 acres.

Treated 1937 - 134 trees. Estimated 1938 infestation - 45 trees.

Budworm damage varies from none to heavy. Attacked trees are in general large and apparently healthy individuals with 70 percent of the attacks being considered as medium to heavy. General condition of trees and foliage good.

MORMON CREEK - 360 acres.

Treated 1937 - 238 trees. Estimated 1938 infestation - 44 trees.

Whole area in general looks good even with considerable budworm injury in 1938 in upper portion of area. Over 80 percent of the trees infested showed medium to heavy attack.

MORMON-GRINNEL CREEK SLOPE - 1,000 acres.

Treated 1937 - 0 trees. Estimated 1938 infestation - 74 trees.

Trees on this slope were in very healthy condition as a whole. No budworm damage was observed. Of the infested trees about 70 percent showed medium and heavy attack. Trees attacked were very large and possessed heavy green foliage. Not over 25 percent of the area is timbered, so the per-acre attacks are much heavier than indicated by the data.

GREENER CREEK - 100 acres.

Treated 1937 - 185 trees. Estimated 1938 infestation - 15 trees.

Pre-1938 budworm and beetle damage heavy; little budworm damage in 1938. With only 60 percent of the attacked trees showing medium degree of attack, the infestation seems to be losing much of its vigor in this drainage. However, the many weakened trees in the area offer excellent host material and probably little resistance to attack.

OVERLOOK GULCHES - 288 acres.

Treated 1937 - 284. Estimated 1938 infestation - 107 trees.

In general these areas have sustained heavy losses from both budworm and beetles, but the current year's vigorous growth of the Douglas fir has nullified the light and medium damage of the budworm and given the timber a fairly healthy appearance. About 75 percent of the infested trees show medium to heavy attacks.

RIENECKER CREEK - 200 acres.

Treated 1937 - 140 trees. Estimated 1938 infestation - 123 trees.

Budworm and beetle damage have been severe prior to 1938 but little 1938 defoliation was recorded. About 70 percent of the trees showed medium to heavy attacks. Most of the unattacked trees show fair growth for the present season.

SPRING DRAW - 200 acres.

Treated 1937 - 480 trees. Estimated 1938 infestation - 228 trees.

Only light damage in 1938 by budworm was noted in this area which has suffered severely from both budworm and beetle damage during previous years. The heavy infestation still present in this area indicates the necessity for treatment. However, many (about 45 percent) of the trees have been only lightly attacked and that is usually confined to the basal two or three feet. Peeling standing would seem to be most economical on such trees.

LIMBY CREEK - 450 acres.

Treated 1937 - 585 trees. Estimated 1938 infestation - 129 trees.

In the past, severe injury from budworm and beetles has occurred in this area, but damage from them in 1938 showed a decided decrease. All infested trees show medium to heavy attacks. In lower part of drainage about 40 percent of stand has been killed.

THREE DRAW SLOPE - 225 acres.

Treated 1937 - 220 trees. Estimated 1938 infestation - 88 trees.

The previous heavy budworm damage in this area is only slightly in evidence at this time. About 75 percent of the infested trees show medium to heavy attacks.

GOFF CREEK - 580 acres.

Treated 1937 - 1050 trees. Estimated 1938 infestation - 282 trees.

Budworm injury light but present over much of area. However, tree growth apparently more than offset the damage, in 1938. Prior to 1938 budworm and beetle damage had been severe. About 65 percent of trees showed medium to heavy attack.

ELEPHANT HEAD - 216 acres.

Treated 1937 - 143 trees. Estimated 1938 infestation - 71 trees.

No budworm damage. Heavy previous losses from budworm and beetle, but remaining living trees are recovering nicely. The fairly heavy character of attacks, (63 percent medium and heavy) and heavy concentration per acre indicate the need for control. Attacked trees were in most cases those previously top killed.

LITTLE ELEPHANT HEAD - 40 acres.

Treated 1937 - 29 trees. Estimated 1938 infestation - 17 trees.

About 35 percent of timber dead. Much of remainder had been heavily defoliated and is now dead in the top. No budworm damage noted. Over 60 percent of the trees showed a medium attack; the remainder light. Foliage was in general sorrel.

CHIMNEY ROCK CREEK - 950 acres.

Treated 1937 - 530 trees. Estimated 1938 infestation - 480 trees.

In the lower parts of this drainage almost the entire stand has succumbed to budworm and beetle attacks, and the attacked trees are now to be found on the higher slopes and upper parts of the drainage. No budworm damage was noted in 1938, and much of the timber is showing good recovery. About 40 percent of attacks were light and in trees greatly weakened by previous damage, but many trees (60 percent) showed medium to heavy attacks.

GOFF CREEK-WEST LOST DRAW RIVER AREA - 60 acres.

Treated 1937 - 0 trees. Estimated 1938 infestation - 15 trees.

Only light budworm damage in few spots. Attacked trees in area where pre-1938 budworm and beetle damage had been heavy. Control is justified, as area readily accessible and 75 percent of attacks medium to heavy.

WEST LOST DRAW - 102 acres.

Treated 1937 - 528 trees. Estimated 1938 infestation - 23 trees.

This area, which supported a heavy infestation last year, shows very little this season judging from the data secured. Very little host material for the Douglas fir beetle remains in much of this area. In places the remaining stand living is less than 10 percent of the original amount and much of that is top killed and in excellent shape for Douglas fir beetle attacks. Budworm damage light in area in 1938.

LOST DRAW - 100 acres.

Treated 1937 - 340 trees. Estimated 1938 infestation - 79 trees.

Rather severe ^{bud}worm defoliation as well as a fairly heavy bark beetle infestation is present within this area. In the lower part of this drainage very little living timber has survived the severe defoliation. The upper parts of drainage, which support a heavy stand of Douglas fir now being invaded. Of the trees infested, over 60 percent showed medium to heavy attacks.

PALISADE CREEK - 140 acres.

Treated 1937 - 74 trees. Estimated 1938 infestation - 21 trees.

This area is close to the road and has suffered heavy losses prior to 1938. Now very little budworm activity is noticeable. Over 50 percent of the timber has been killed. About 80 percent of the infested trees show medium intensity of attack.

CLIFF CREEK - 65 acres.

Treated 1937 - 0 trees. Estimated 1938 infestation - 22 trees.

Budworm damage light in 1938. Over 40 percent of timber killed in lower part of drainage, decreasing in amount toward upper parts of area. Bark beetle infested trees have little foliage and 80 percent are considered as medium. Ample weakened host material remaining.

CASTLE GULCH - 127 acres.

Treated 1937 - 32 trees. Estimated 1938 infestation - 52 trees.

About 60 percent of the timber in this small drainage has been killed. The bark beetle outbreak is still active and over 85 percent of the infested trees show a medium to heavy attack. Very little 1938 budworm work was noted. The infested trees had fading foliage.

SAWMILL GULCH - 200 acres.

Treated 1937 - 75 trees. Estimated 1938 infestation - 27 trees.

Apparently many trees attacked in 1937 on this area were not treated and have been the source of the medium and heavy attacks noted on the area. The budworm has caused light losses this year. Remaining trees recovering.

CEDAR GULCH-SAWMILL CREEK RIVER AREA - 120 acres.

Treated 1937 - 0 trees. Estimated 1938 infestation - 9 trees.

Most of timber in this area in good condition. The trees infested showed a medium attack. Area adjoins others which have been heavily infested in the past. Area close to and in view of road should be checked, although there may be no serious infestation.

~~SAW~~ CREEK - 256 acres.

Treated 1937 - 137 trees. Estimated 1938 infestation - 70 trees.

Slight budworm damage in 1938. In north end of drainage and in lower slopes further south at least 40 percent of stand is dead. On remainder of drainage losses have been less and the stand is recovering nicely. Because of its high visibility, accessibility, and the type of attacks (about 85 percent medium and heavy), control is considered essential.

GUNBARREL (LOWER) - 425 acres.

Treated 1937 - 279 trees. Estimated 1938 infestation - 317 trees.

Present infestation chiefly above rimrock and on area $1\frac{1}{2}$ miles from Absaroka Lodge, on east side and fork of drainage where no treating had been done in 1937. Latter area probably contains 200 of the attacked trees. Budworm damage for 1938 very light. Eighty percent of 1938 attacks are medium to heavy and the area reasonably accessible. In lower part of drainage only 15 to 25 percent of original timber is now alive.

BLACKWATER SHEEP CREEK RIVER AREA - 250 acres.

Treated 1937 - 3 trees. Estimated 1938 infestation - 93 trees.

Infestation concentrated in area above rimrock, near Sheep Creek, where budworm and beetle damage prior to 1938 had been severe. Slight budworm damage in 1938 but many badly weakened trees. Below the rimrock and for about 25 chains along river there are scattered fading firs believed to be attacked by the Douglas fir beetle.

AREAS WHERE INSTITUTION OF CONTROL IS QUESTIONABLE

Treatment to be Secondary to those
Areas for which Control is Recommended

EAGLE-CANFIELD CREEK RIVER AREA - 750 acres.

Treated 1937 - 0 trees. Estimated 1938 infestation - 271 trees.

Feel that this estimate may be somewhat high and think 200 may be nearer the actual number. Some of these trees were lightly attacked and even subsequent fill-in may not cause their death. No budworm damage in 1938 and trees look fairly healthy. That the infestation still is fairly aggressive seems to be indicated by more than 60 percent of them showing medium to heavy attack.

NEWTON CREEK (UPPER) - 1200 acres.

Treated 1937 - 704 trees. Estimated 1938 infestation - 409 trees.

Budworm damage general but light over most of area; severe damage on one small area. Pre-1938 budworm and beetle damage had been severe, leaving excellent host material for bark beetles. One-half 1938 Douglas fir beetle attacks light; other half medium and heavy.

EAGLE CREEK (LOWER) - 700 acres east side. 1500 west side.

Treated 1937 - 0 trees. Estimated 1938 infestation - 55 east side. 412 west side.

West Side

At the head of the first large draw draining into Eagle Creek from the west there is light to medium 1938 budworm defoliation and some concentration of beetle work on the south-facing slope. On the second large draw an area of 25 to 50 acres shows severe budworm defoliation and a heavy concentration of beetle work. This area is less than one-half mile from the trail. On the third large draw, about 20 to 30 chains further south, another concentration of beetle work is present.

East Side

Budworm damage in general light, where it is present. It is believed the major portion of the beetle work is present around six groups of red-top and fading trees with the remainder of the area showing very few trees.

KITTY CRUNK - 600 acres.

Treated 1937 - 0 trees. Estimated 1938 infestation - 83 trees.

Much of the infestation seems to be in the western and northern part of the drainage about one mile from the colony. Trees on the ridges next to the mountain were 14 inches to 16 inches in diameter and hit in 1937 lightly and killed in 1938. The trees off the ridges were much larger and not heavily hit. Attacked trees on the ridge to the southwest of the colony and the next two draws south might be treated, as the infestation seems to be concentrated there but is quite light in the large area of heavier timber on the lower slopes, and in my opinion that portion does not warrant control work. On the ridges 60 of the estimated 83 trees would probably be found. No budworm work and except for areas showing concentration of infestation, timber very healthy.

CONTROL MEASURES ARE NOT RECOMMENDED
FOR THE FOLLOWING AREAS

Unit	Acres	Infested trees		
		Est. 1937	Treated 1937	Est. 1938
Blackwater	100	0	0	55
Mesa Creek	171	6	0	25
Pahaska Lodge to Park	300	57	11	46
Grinnel Creek	250	113	152	60
Pahaska-Grinnel Slope	250	146	102	7
Crow Creek	350	70	0	0
Canfield Pahaska	1500	0	0	0
Crow Creek-Pahaska	300	0	0	0
North Fork Slope Pahaska	750	950	272	17
Canfield Creek	1500	94	0	0
Kitty Creek (upper)	1500	0	0	27
Chimney Rock Flat	50	0	0	0
Sheep Mesa River Area	0	0	0	0
French Gulch	0	0	0	0
Libby Flat	0	0	0	0
Cedar Gulch	95	37	327	7
Aspen Ridge	0	0	0	0
Newton Creek (lower)	95	0	0	0
Moss Creek	272	0	8	0
Newton-Cedar River Area	175	0	0	0
June-Blackwater River Area	0	0	0	0
Draw East Sawmill	0	0	0	0
Cliff-Palisade River Area	33	0	0	3
Draw East Chimney Rock	0	0	0	0
Gunbarrel	580	0	0	33

SUMMARY

Within the areas recommended for control the number of trees infested in 1938 is estimated to be 2,793, which is a reduction of 54 percent of the number (5,819) treated on these areas in 1937. This is a satisfactory reduction and indicates that the source of beetle supply within the untreated areas is becoming exhausted. The character of this year's attacks also indicates this condition.

There are three areas for which the institution of control is questionable, as the benefits to be derived are uncertain. These areas are somewhat remote from the highway, and for the most part the beetles are working in trees that are badly weakened as a result of severe budworm defoliation. There are 818 infested trees within these areas, which is practically 30 percent of the number within the areas for which control has been recommended. If means are available for the treatment of these trees, the total beetle population would be reduced, which would be of some advantage to the project. However, as these units are only a part of the so-called "back areas", the work should be made secondary to the areas for which control is recommended.

The most gratifying condition recorded in this year's infestation is the reduced spruce budworm infestation. Only in one or two areas was the defoliation recorded as being serious, and in other units it was barely discernible. Apparently the reduced budworm defoliation during the past two seasons has already been reflected in the character of the Douglas fir beetle attacks. Lighter attacks were recorded in 1937, a

condition which is more noticeable at the present time. The attacks are light and in most instances confined to the lower or basal portion of the bole. It is believed that with the cessation of the budworm epidemic, which during the past years has provided a continuous supply of weakened and extremely favorable host material, the Douglas fir beetle infestation will cease to be of importance and control measures can be discontinued. During the life of this project it has been fully realized that as long as weakened host material was provided by budworm defoliation, control measures would be necessary to prevent the bark beetle population from developing to such numbers as to destroy trees around the resorts, summer homes, and camp sites for which protection was especially desired.

As during the past years it has not proved feasible to institute control within the so-called "back areas" of infestation, these units were omitted from this season's survey because of the expense involved.